WE CLAIM:

1. A method for resizing a pattern in real time to dynamically photolithographically transfer an image of the resized pattern onto a surface, said method comprising:

generating a first rendering of the pattern, the first rendering including first pixel data representing the pattern;

generating a second rendering of the pattern, the second rendering including second pixel data representing the pattern, the pattern in the second rendering being spatially offset from the pattern in the first rendering; and

selecting portions of the first and second pixel data to form the resized pattern and to dynamically photolithographically transfer the image of the resized pattern onto the surface.

2. The method of Claim 1, further comprising:

generating at least a third rendering of the pattern, the pattern in the third rendering being spatially offset from the pattern in both the first and second renderings, said selecting being performed based on at least the first, second and third renderings.

3. The method of Claim 1, wherein said generating the first rendering includes mapping the pattern onto an array of light modulation elements within a spatial light modulator in a first positional alignment relative to the array, and said generating the second rendering includes mapping the pattern onto the array in a second positional alignment relative to the array.

4. The method of Claim 3, wherein the first and second positional alignments are offset by a fraction of a dimension of one of the light modulation elements.

5. The method of Claim 1, further comprising:

determining a distortion in the surface and performing said selecting as a function of the distortion.

6. The method of Claim 5, wherein said determining further comprises:

positioning the surface in at least one position relative to an image sensor operable to image at least one alignment feature located on the surface; and

calculating the location of the at least one alignment feature on the surface to determine the distortion in the surface.

7. The method of Claim 5, wherein said selecting further comprises:

defining a misalignment threshold;

selecting the first pixel data from a portion of the first rendering corresponding to a first region of an array of light modulation elements within a spatial light modulator, the portion of the first rendering producing a misalignment of the pattern relative to the surface as a function of the distortion in the surface less than the misalignment threshold; and

selecting the second pixel data from a portion of the second rendering corresponding to a second region of the array, the portion of the second rendering producing a misalignment of the pattern relative to the surface as a function of the distortion in the surface less than the misalignment threshold.

8. The method of Claim 7, wherein said selecting the second pixel data further comprises:

determining at least one region in the array where the misalignment of the first rendering is greater than the misalignment threshold; and

selecting the second pixel data from the portion of the second rendering corresponding to the at least one region of the array.

9. The method of Claim 1, further comprising:

determining a distortion in at least one optical element, said selecting being performed as a function of the distortion.

10. A method for resizing a pattern in real time to dynamically photolithographically transfer an image of the resized pattern onto a surface, said method comprising:

generating two or more spatially offset renderings of the image, each spatially offset rendering including respective pixel data representing the pattern, the pattern being spatially offset between the renderings;

measuring a distortion; and

selecting the pixel data from portions of the two or more spatially offset renderings as a function of the distortion to form the resized pattern and to dynamically photolithographically transfer the image of the resized pattern onto the surface.

11. The method of Claim 10, wherein said determining further comprises:

positioning the surface in at least one position relative to an image sensor operable to image at least one alignment feature located on the surface; and

calculating the location of the at least one alignment feature on the surface to determine the distortion in the surface.

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12. The method of Claim 11, wherein said positioning further comprises:

aligning the surface relative to an optical element optically coupled to the image sensor.

13. The method of Claim 11, wherein said positioning further comprises:

aligning the surface relative to an optical element optically coupled to the image sensor and the spatial light modulator.

14. The method of Claim 11, wherein said calculating further comprises:

computing at least one of the following distortion characteristics: stretching, shrinking, tilting and bowing.

15. The method of Claim 10, wherein said selecting further comprises:

defining a misalignment threshold; and

selecting the pixel data from the portions of the two or more spatially offset renderings that produce a misalignment of the pattern relative to the surface as a function of the distortion in the surface less than the misalignment threshold.

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16. The method of Claim 10, further comprising:

storing the pixel data from the spatially offset renderings by interleaving the pixel data from each of the spatially offset renderings.

17. A dynamic photolithography system, comprising:

a spatial light modulator including light modulation elements for dynamically photolithographically transferring an image of a pattern onto a surface; and

an image processing system operable to generate and store two or more spatially offset renderings of the pattern, each spatially offset rendering including respective pixel data identifying respective light modulation elements within said spatial light modulator representing the pattern, the pattern being spatially offset between the renderings, said image processing system being further operable to load select pixel data corresponding to selected portions of the two or more spatially offset renderings of the pattern into said spatial light modulator.

18. The dynamic photolithography system of Claim 17, wherein the light modulation elements are arranged in an array, and wherein said image processing system is operable to generate the two or more spatially offset renderings of the pattern by mapping the pattern onto the array in respective positional alignments relative to the array.

19. The dynamic photolithography system of Claim 18, wherein the positional alignments are offset from each other by a fraction of a dimension of one of the light modulation elements.

20. The dynamic photolithography system of Claim 17, further comprising:

an image sensor connected to provide an image of at least one alignment feature located on the surface to said image processing system, said image processing system being further operable to calculate distortion in the surface as a function of the location of the at least one alignment feature on the surface.

21. The dynamic photolithography system of Claim 20, further comprising:

an optical element optically coupled to said image sensor and aligned with the surface.

22. The dynamic photolithography system of Claim 21, wherein said optical element is optically coupled to said image sensor and said spatial light modulator.

23. The dynamic photolithography system of Claim 20, wherein the distortion includes at least one of: stretching, shrinking, tilting and bowing.

24. The dynamic photolithography system of Claim 20, wherein the select pixel data is loaded as a function of the distortion.

25. The dynamic photolithography system of Claim 24, wherein said spatial light modulator includes active light modulation elements and reserve light modulation elements, the select pixel data loaded into said spatial light modulator corresponding to at least a portion of the active light modulation elements based on the distortion.

26. The dynamic photolithography system of Claim 24, wherein the image includes subimages, the pixel data loaded into said spatial light modulator representing at least a portion of one of the subimages based on the distortion.

27. The dynamic photolithography system of Claim 17, wherein the surface has a distortion, and wherein said image processing system is further operable to define a misalignment threshold and select portions of the two or more renderings producing a misalignment of the pattern relative to the surface as a function of the distortion in the surface less than the misalignment threshold.

28. The dynamic photolithography system of Claim 17, wherein the light modulation elements are operable to be altered as a function of the loaded pixel data.

29. The dynamic photolithography system of Claim 28, wherein the light modulation elements are liquid crystal elements.

30. The dynamic photolithography system of Claim 28, wherein the light modulation elements are micromirrors.

31. An image processing system for use in a dynamic photolithography system, comprising:

a storage unit for storing two or more renderings of a pattern to be photolithographically transferred onto a surface, the pattern being spatially offset between the two or more renderings;

a processor operable to generate the two or more spatially offset renderings, each spatially offset rendering including respective pixel data identifying respective pixels representing the pattern, said processor being further operable to access the storage unit and retrieve select pixel data corresponding to selected portions of the two or more spatially offset renderings.

32. The image processing system of Claim 31, wherein said image processing system is further operable to calculate distortion in the surface and retrieve the select pixel data corresponding to the selected portions of the two or more spatially offset renderings as a function of the distortion.

33. The image processing system of Claim 32, wherein said image processing system is further operable to define a misalignment threshold and select portions of the two or more renderings producing a misalignment of the pattern relative to the surface as a function of the distortion in the surface less than the misalignment threshold.